UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 7, 2002

MEMORANDUM TO: C. W. Reamer, Chief
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

FROM: Robert M. Latta, Sr. On-Site Licensing Representative
Repository Site Section
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

Neil M. Coleman, (Acting) On-Site Licensing Representative
Repository Site Section
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

SUBJECT U.S. NUCLEAR REGULATORY COMMISSION ON-SITE LICENSING REPRESENTATIVES' REPORT ON YUCCA MOUNTAIN PROJECT FOR NOVEMBER 1, 2001, THROUGH DECEMBER 31, 2001

The purpose of this letter is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (OR's) report for the period of November 1, 2001, through December 31, 2001.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The OR's continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTI's) and their resolution. During this reporting period, the OR's continued to observe activities associated with Yucca Mountain Site Characterization, KTI's, and auditing. The OR's also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

If you have any questions on this report or its enclosures, please call Robert Latta on (702) 794-5048 or Neil Coleman on (702) 794-5047.

Enclosures: U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report
ESF/ECRB Plan View Alcove, Niche and Borehole Test Locations
Nye County Early Warning Drilling Program Drillhole Locations
ATC Site Layout/ATC Cross-hole Configuration

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ADAMS ACCESSION NUMBER: ML020370597
ADAMS DOCUMENT TITLE: U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report on Yucca Mountain Project for November 1, 2001, through December 31, 2001

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U.S. NUCLEAR REGULATORY COMMISSION

ON-SITE LICENSING REPRESENTATIVES' REPORT

NUMBER OR-06-01

FOR THE REPORTING PERIOD OF NOVEMBER 1, 2001 THROUGH DECEMBER 31, 2001

/s/
Robert M. Latta
Sr. On-Site Licensing Representative
High-Level Waste Branch
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NUMBER OR-06-01

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REPORT DETAILS

1.0 EXECUTIVE SUMMARY

EVALUATION OF SELF-ASSESSMENT PROGRAM IMPLEMENTATION

The OR reviewed the results of recently completed Department of Energy (DOE) self-assessments to determine if the corrective action programs were effective. It was determined that a self-assessment program had been developed and that the self-assessment process was effective in identifying areas for improvement. However, program implementation was less than completely effective as indicated by several Deficiency Reports (DR's). In response to these issues, the DOE developed a corrective action initiative to improve the effectiveness of the self-assessment program.

DEFICIENCIES DATABASE

DOE Office of Quality Assurance (OQA) has completed the review of recurring scientific notebooks (S/N) deficiencies and the evaluation, provided several recommendations aimed at minimizing S/N deficiencies. Progress related to implementation of the recommendations will be evaluated and the results will be documented in a future OR report.

DOE QA AUDIT OF YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE

NRC, OR Open Item 01-01 related to the qualification and training of project personnel, remains open pending the review and evaluation of the requested documentation.

GEOTECHNICAL INVESTIGATIONS

During this reporting period project personnel installed enhanced monitoring and collection equipment in the east-west drift, and collected rock samples for geomechanical tests. A new bulkhead was installed at 22+01, and on November 14, 2001, the bulkheads from 22+01 and beyond were closed. Additional sampling and equipment installation was done between 17+63 and 22+01, and then the bulkhead at 17+63 was closed on December 20, 2001.

Thermal conductivity boreholes at Station 16+62 are instrumented and collecting data. Samples of tunnel wall rock have also been collected for thermal conductivity measurements. The two hole array test is in a cool down monitoring phase. Collection of baseline data for the six hole array at Station 15+35 is complete and this array is now heating up.

The current infiltration rate on the trench in Alcove 8 remains approximately 9.0 liters per hour, and the seepage rate in Niche #3 is roughly 5 percent of the infiltration rate. DOE has deferred the start of infiltration on the 3 X 4 meter plot until testing on this fault is completed. Seepage testing on this fault continues through this reporting period and will likely continue through FY2002.

DOE scientists are proceeding with a study to validate the presence of bomb-pulse Cl-36 at two locations in the ESF. The new studies continue to show no bomb-pulse Cl-36 in the samples. During the next reporting period, on January 16, DOE will hold an internal workshop on Cl-36. An update on Cl-36 will be presented at the next Nuclear Waste Technical Review Board (NWTRB) meeting, January 29-30, 2002, to be held in Pahrump, NV.

The power to the heated drift (Alcove 5) is scheduled to be turned off in mid-January, 2002, and the facility will be monitored during the cool-down stage. Regarding the study of elevated fluoride concentrations in water samples, DOE has produced a "white paper" that evaluates the

likely sources of elevated fluoride. The draft report concludes that "The results of the field test confirm the hypothesis that the source of the fluoride...is the introduced test materials (i.e. Viton™ and/or Teflon™)."

In October 2001 UNLV's fluid inclusion report was sent to DOE in draft form, in two parts. The report comments on the timing of thermal fluids at Yucca Mountain. Based on two different approaches, fluids with elevated temperatures were present at Yucca Mountain more than 2.9 million years ago. DOE will provide an update on the fluid inclusion studies at the NWTRB meeting in Pahrump, Nevada in late January, 2002.

At the Alluvial Tracer Complex, preparations have been made to conduct a multi-well aquifer test in which tracers will be injected in wells IM1 and IM2. Zone 4 (the deepest alluvium zone) in well 19D/D1 will be pumped to obtain large-scale estimates of transmissivity. If tracers from the other wells are recovered, dispersivity can also be estimated.

WASTE HANDLING BUILDING GEOTECHNICAL INVESTIGATION

DOE continued the work of integrating geotechnical information collected from drilling and geophysical logging of 15 shallow boreholes and four test pits. A draft report has been issued and is under review by DOE. Final reports on these activities are expected to be submitted to DOE by the middle of FY 2002.

BUSTED BUTTE UNSATURATED ZONE TRANSPORT TEST

Atomic Energy of Canada, LTD., continued to perform radionuclide transport testing on blocks of rock extracted from the Busted Butte Test Facility. Chemically reducing conditions have been found within a block. The reasons for this are being reviewed.

ENGINEERED BARRIER SYSTEM (EBS) TESTING

Pilot Scale Testing - Pre-closure Ventilation Test

Phase II EBS ventilation testing, which started in April 2001, was completed during this reporting period. This test simulated the ability of the inlet air, at different temperatures, to maintain sub-boiling temperatures at the emplacement drift wall in a potential repository. DOE developed a test plan for Phase III testing which will add moisture to the porous media in the simulated invert to determine the effect on ventilation efficiency. DOE is also performing a Post-closure Ventilation Test to study the convective heat transfer in the post-closure time period. This test is under construction at the EBS test facility.

NATURAL ANALOGS - PENA BLANCA TESTING

Drilling and testing activities at Pena Blanca, Mexico are expected to begin in the near future. Accordingly, details will be addressed in future OR reports.

REPORT DETAILS

2.0 INTRODUCTION

The principal purpose of the OR report is to inform NRC staff, managers, and contractors of information on the DOE programs for site characterization, repository design, performance assessment, and environmental studies that may be of use in fulfilling NRC's role during prelicensing consultation. The primary focus of this and future OR reports will be on DOE's programs for the ESF, surface-based testing, performance assessment, data management systems, and environmental studies. Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to pursue site suitability. The OR's also participate in activities associated with resolving NRC Key Technical Issues's (KTI's). In addition to communication of this information, this report may raise potential licensing concerns, or express opinions. These items represent the views of the OR's. The reporting period for this report covers November 1, 2001, through December 31, 2001.

3.0 OBJECTIVES

The OR mission is to principally serve as a point of prompt informational exchange and consultation and to preliminarily identify concerns about site investigations relating to potential licensing issues. The OR's accomplish this function by communicating, consulting and identifying concerns. Communication is achieved by exchanging information on data, plans, schedules, documents, activities and pending actions, and resolution of issues. The OR's consult with DOE scientists, engineers, and managers with input from NRC Headquarters management on NRC policy, philosophy, and regulations. The OR's also focus on such issues as QA, design controls, data management systems, performance assessment, and KTI's resolution. A primary OR role is to identify areas in site characterization and related studies, activities, or procedures that may be of interest or concern to the NRC staff.

4.0 QUALITY ASSURANCE AND ENGINEERING

Evaluation of Self-Assessment Program Implementation
The Office of Civilian Radioactive Waste Management (OCRWM) self-assessment program is implemented in accordance with Procedure AP-2.20Q, Revision 0. As described in AP-2.20Q, the objective of the self-assessment program is to evaluate ongoing work activities to identify conditions that impede organizations from achieving their objective, to focus on performance process and product improvement, identify best work practices or weaknesses, and to provide a feedback mechanism.

During this reporting period the OR examined selected aspects of the self-assessment program. Specifically, the OR evaluated the results of recently completed self-assessments to determine if the corrective action programs effectively identified areas for improvement and to confirm that condition(s) adverse to quality were appropriately documented and resolved.

Based on the results of these reviews and discussions with cognizant project personnel it was determined that a self-assessment program had been developed and that the self-assessment process was effective in identifying areas for improvement. However, program implementation was less than completely effective as indicated by several DR's related to the failure to develop adequate self-assessment schedules, enter conditions into Condition/Issues Identification and Reporting/Resolution System (CIRS), and submit completed self-assessment reports to the Records Management Processing Center. Also, as documented in the recently completed Semi-Annual Review of the Self-Assessment Process, several procedural requirements were not consistently followed during the performance of self-assessments.

In response to these issues, DOE developed a corrective action initiative to improve the effectiveness of the self-assessment program. Elements of this initiative include revising the governing procedure, AP-2.20Q, to clarify and strengthen program requirements, establishing a comprehensive self-assessment schedule for FY 2002, developing a uniform checklist for the review of completed self-assessment reports by program manager/leads, and preparing metrics to evaluate the effectiveness of the self-assessment program. At the conclusion of this reporting period these initiatives were still under development. Accordingly, the OR's will evaluate the effectiveness of these corrective actions and will document the results in a future OR report.

DEFICIENCIES DATABASE

In the March/April 2001 OR report, the OR review of the database used for tracking deficiencies adverse to quality revealed that there may be areas where there are recurrences of deficiencies that were previously identified and closed. One area of a suspected trend was the recurrence of S/N deficiencies. These increased deficiencies prompted the DOE OQA to initiate a review of the recent documentation information pertaining to S/N's . This review was completed and the evaluation provided several recommendations aimed at minimizing S/N deficiencies. Progress related to implementation of the recommendations will be evaluated and the results will be documented in a future OR report.

DOE QA AUDIT OF YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE

During the August 6-10, 2001, DOE Quality Assurance (QA) audit of the Yucca Mountain Site Characterization Office, six DR's and an NRC OR Open Item 01-01 that is related to the absence of a Position Description (PD) were identified. During the audit, the OR requested three PD's to determine whether individuals had the necessary education and experience to demonstrate compliance with the requirements in the PD. Two of the individuals occupying these positions were sufficiently qualified and met the PD requirements. The remaining PD evaluation completion is pending the OR's receipt and review of the necessary training records to determine whether sufficient information exists to demonstrate compliance with the PD requirements. NRC, OR Open Item 01-01 remains open pending the review and evaluation of the requested documentation.

QA Technical Requirements Not Incorporated

As previously reported in the October/November 2001, OR Report, a review of four recent DOE audits of suppliers listed on the Qualified Suppliers List, indicated that purchase orders had been issued which failed to include appropriate QA/technical requirements. This condition was documented as a repetitive occurrence and was identified as NRC Open Item 01-01. However, this item should have been identified as NRC Open Item 01-02. Accordingly, the identification

of this item has been corrected for future tracking purposes. Subsequent review of this issue also showed that the audits had been conducted by Bechtel/SAIC QA rather than DOE's Office of Quality Assurance as indicated in the subject OR Report. DOE OQA is working with BSC QA to facilitate an acceptable response to close this Open Item. Progress related to this Open Item will be evaluated and the results will be documented in a future OR report.

5.0 OUTREACH ACTIVITIES

Public Forum/Panel Discussion on Judging Yucca Mountain: Nevada Speaks
On November 14, 2001, the OR's attended a Public Forum/Panel Discussion at the University of Nevada Las Vegas. The purpose of this Forum was to examine the science, the law, and the risk aspects associated with the potential High-Level Waste Repository at Yucca Mountain. The panel discussions included brief presentations on nuclear waste risk perception; transportation considerations; socioeconomic impact assessment; legitimacy of the Nuclear Waste Policy Act; and consideration of state and local government issues. Public interaction was encouraged and remarks were recorded for transmittal to Nevada's Congressional Delegation and other officials. Citizens were provided with the opportunity to write, e-mail, phone, or fax their comments to their elected representatives.

Nevada Legislature's Committee on High-Level Radioactive Waste Meeting
On November 15, 2001, the OR's attended the public meeting of the Nevada Legislature's Committee on High-Level Radioactive Waste in Las Vegas, Nevada. This Committee evaluates information and policies regarding the location, within the state, of a facility for the disposal of high-level radioactive waste and any potentially adverse effects from the construction and operation of such a facility. The Committee was provided with an update on the status of the High-Level Radioactive Waste Program by the DOE. This update included the status of underground and surface based studies; findings of the Site Suitability Evaluation Report; results of public hearings; and the schedule for possible recommendation by the Secretary of Energy to the President. Also, the Nevada Agency for Nuclear Projects presented the results of their Yucca Mountain monitoring activities, findings of the State Impact Review and the status of pending court actions regarding the potential high-level waste repository. The presentations were informative and the Committee members were receptive to the information updates.

6.0 GEOTECHNICAL INVESTIGATIONS AND NRC KEY TECHNICAL ISSUES

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK (ECRB)
The excavation of the ECRB, completed on October 13, 1998, allows the collection of scientific and engineering data in stratigraphic units that constitute the bulk of the potential repository horizon. DOE continues ECRB testing to maximize the data available to support DOE TSPA - Site Recommendation. Enclosure 2 describes the ESF and ECRB test locations. ECRB testing activities are summarized below.

Passive Hydrologic Test
During November and December project personnel installed enhanced monitoring and collection equipment, including remote cameras and moisture collection devices, in accordance with the revised test plan. Plastic sheets and drip cloths infused with a pH sensitive chemical were installed near the crown, and numerous sample bottles were placed to collect possible drips from rock bolts. A gas sampler was also installed. Rock samples were collected from both the Topopah Spring lower nonlithophysal and lower lithophysal zones for thermal conductivity measurements and analysis of geomechanical properties. Geologic mapping was also conducted. A new bulkhead was installed at Station 22+01, and on November 14, 2001, the bulkheads from Station 22+01 and beyond were closed. Additional sampling and equipment installation was done between Stations 17+63 and 22+01, and then the bulkhead at Station 17+63 was closed on December 20, 2001. The OR's will continue to monitor these test activities and document the results in future reports.

Niche #5
Air-permeability testing and ground penetrating radar testing were completed and the results of the infiltration testing are being reviewed. Testing will resume in February 2002.

Systematic Hydrologic Characterization (SHC)
During this reporting period, DOE continued to perform SHC testing in a series of 20 meter deep boreholes in the Topopah Spring lower lithophysal zone. Testing has been completed in the arrays at Station 16+95. DOE has completed testing activities at Station 16+65 meters. Testing on existing arrays will be completed. However, no additional systematic borehole drilling is planned for FY02.

In-Situ Thermal Conductivity Measurements
Thermal conductivity boreholes at Station 16+62 are instrumented and collecting data. Samples of tunnel wall rock have also been collected for thermal conductivity measurements. Because of their small size, these samples will likely provide less representative values of thermal conductivity than the larger-scale borehole thermal experiments. The two hole array test is in a cool down monitoring phase. Collection of baseline data for the six hole array at Station 15+35 is complete and this array is now heating up.

Alcove 8:
The current infiltration rate on the trench in Alcove 8 remains approximately 9.0 liters per hour, and the seepage rate in Niche #3 is roughly 5 percent of the infiltration rate. DOE has deferred the start of infiltration on the 3 X 4 meter plot until testing on this fault is completed. Seepage testing on this fault continues through this reporting period and will likely continue through FY2002.

EXPLORATORY STUDIES FACILITY (ESF) TESTING

Seepage Testing
DOE has completed moisture monitoring and testing in Alcoves 1, 2, 6, and Niches 1, 2. Limited moisture monitoring and seepage testing continues at Alcoves 3, 4, 7 and Niches 3 and 4. Ongoing ESF testing activities are summarized below.

Chlorine-36 (Cl-36) Validation Study
DOE scientists are proceeding with a study to validate the presence of bomb-pulse Cl-36 at two locations in the ESF. Approximately 60 samples have been collected in the vicinity of the Drill Hole Wash Fault and the Sundance Fault where elevated concentrations of Cl-36 were detected in a previous Los Alamos study. These samples are being analyzed for Cl-36, tritium, technetium-99, and supplemented by analyses of uranium, thorium, iodide-129 and radium isotopes. The new studies continue to show no bomb-pulse Cl-36 in the samples. During the next reporting period DOE will hold an internal workshop on Cl-36. An update on Cl-36 issues will be presented at the next Nuclear Waste Technical Review Board meeting, which is scheduled for January 29-30, 2002, in Pahrump, Nevada.

Alcove 5 (Thermal Testing Facility Access/Observation Drift, Connecting Drift, and Heated Drift)
In accordance with established test schedules, the power to the heated drift will be turned off in mid-January and the facility will be monitored during the cool-down stage. Regarding the study of elevated fluoride concentrations in water samples, DOE has produced a "white paper" that evaluates the likely sources of elevated fluoride. The OR office has received a draft copy. The report concludes that "The results of the field test confirm the hypothesis that the source of the fluoride...is the introduced test materials(i.e. Viton™ and/or Teflon™)." Laboratory work is underway to further test and corroborate these results.

Fluid Inclusion Study
In October 2001 UNLV's report was sent to DOE in draft form, in two parts. The draft report was provided to the OR office in November. The report comments on the timing of thermal fluids at Yucca Mountain. Based on two different approaches, fluids with elevated temperatures were present at Yucca Mountain more than 2.9 million years ago. DOE will provide an update on the fluid inclusion studies at the NWTRB meeting in Pahrump, NV in late January.

Laser Strainmeter Test
Construction of strainmeter niche monuments is complete and installation of the remaining instrument enclosure, electrical terminations is continuing. Between the monuments, the "track" through which the laser will be aimed is being aligned. The LSM is expected to be operational by early CY2002.

SURFACE-BASED TESTING

Alluvial Tracer Complex (ATC)
The ATC is a joint Nye County and DOE Cooperative Program to investigate flow and transport properties of the saturated alluvium. Single-well ATC hydrologic and tracer testing at well NC-EWDP-19D/D1 (Enclosures 3 and 4) has been completed. Cross-well hydrologic and tracer testing will also be performed at NC-EWDP-19D/D1.

Initial hydraulic tests have been completed in zones 4-7 of EWDP-19D/D1. These zones are in saturated volcanics beneath the valley fill material. Preparations have been made to conduct a multi-well aquifer test in which tracers will be injected in wells IM1 and IM2. Zone 4 (the deepest alluvium zone) in well 19D/D1 will be pumped to obtain large-scale estimates of transmissivity. If tracers from the other wells are recovered, dispersivity can also be estimated.

Results will be reported in the next period. Before running the multi-well test, the isolation of zone 4 from zone 5 is being checked.

UZ Monitoring
For about 10 years continuous measurements of unsaturated zone conditions have been collected in boreholes NRG7A and UZ4/5. The generators at the borehole sites have been shut down. DOE believes that additional data from these holes is not needed for issue resolution activities. This was discussed with NRC staff during an Appendix 7 meeting in Las Vegas, Nevada, in October of 2001.

Waste Handling Building Geotechnical Investigation
DOE is conducting a geotechnical investigation at the Yucca Mountain North Portal area to collect data for the design of a waste handling building for a potential repository. This activity involved drilling a series of boreholes and excavating trenches and test pits to characterize this area. The field work is completed. DOE continued the work of integrating geotechnical information collected from drilling and geophysical logging of 15 shallow boreholes and four test pits. A draft report has been issued and is under review by DOE. Final reports on these activities are expected to be submitted to DOE by the middle of FY 2002.

Characterization of Near Surface Velocity Structure
DOE is collecting near surface velocity data at Yucca Mountain to help design surface and subsurface facilities for a potential repository. DOE has completed the Spectral Analysis of Surface Waves surveys to assess shear wave profiles of shallow rock units at Yucca Mountain. Testing has also been completed to extend the near surface velocity structure characterization to the potential repository horizon. Analysis modeling and documentation for this activity is expected to be completed in FY2002.

BUSTED BUTTE UNSATURATED ZONE TRANSPORT TEST
Phase II tracer testing was conducted in a separate 10 X 10 X 6 meter block of rock and this testing was completed in December 2000. DOE completed post-test characterization of Phase II tracer testing and the site was closed. The completed work activities (e.g., overcoring selected injection boreholes, partial mine-back of the test block, and rock sampling and analyses), was done to better characterize the distribution of reactive and nonreactive tracers. Prior to site closure, DOE completed the partial mine-back and sampling of the Phase II block. Atomic Energy of Canada, LTD., continued to perform radionuclide transport testing on blocks of rock extracted from the Busted Butte Test Facility. Chemically reducing conditions have been found within a block. The reasons for this are being reviewed.

ENGINEERED BARRIER SYSTEM (EBS) TESTING
The Engineered Barrier System Operations (EBSO) Office of the Yucca Mountain Project continues to perform EBS testing. The EBS tests are performed in a Pilot Scale Test Facility located in North Las Vegas. Test results are used to support the EBS degradation and transport process model report.

Pilot Scale Testing - Pre-closure Ventilation Test
Phase II EBS ventilation testing, which started in April 2001, was completed during this reporting period. This test activity simulated the ability of the inlet air, at different temperatures, to maintain sub-boiling temperatures at the emplacement drift wall in a potential repository. DOE developed a test plan for Phase III testing which will add moisture to the porous media in

the simulated invert to determine the effect on ventilation efficiency. DOE is also performing a Post-closure Ventilation Test to study the convective heat transfer in the post-closure time period. This test is currently under construction at the EBS test facility.

7.0 GENERAL ACTIVITIES

a. Documents Issued

NRC Releases Preliminary Comments Regarding Possible Geologic Repository at Yucca Mountain, Nevada

By letter dated November 13, 2001, the NRC provided preliminary comments to DOE indicating that the NRC believes sufficient information will be available concerning a potential high-level radioactive waste repository at Yucca Mountain, Nevada, that development of an acceptable license application is achievable. As specified in the Nuclear Waste Policy Act of 1982, the NRC's comments concern"....the extent to which the at-depth site characterization analysis and waste form proposal for such site seem to be sufficient for inclusion in any application to be submitted by the Secretary for licensing of such site as a repository." In this context, the term "at-depth site characterization analysis" includes the investigation of underground features, such as rock porosity, as well as events and processes related to seismic activity, volcanism and water transport. The term "waste form proposal" includes information related to spent fuel, cladding, the waste package, and other engineering barriers.

As described in the letter, there are two important constraints related to the NRC's preliminary comments. First, in providing these comments, the NRC is making no conclusions concerning the actual site suitability of the Yucca Mountain site. Rather, the NRC comments address whether sufficient information will exist to begin a potential licensing review should DOE submit a license application. Second, the NRC's licensing decisions for a potential repository at Yucca Mountain, will not occur until (1) DOE submits a high-quality license application; (2) the staff completes its independent safety review and issues a safety evaluation report; (3) NRC provides an opportunity for a hearing; and (4) the NRC makes a final determination on whether the DOE license application meets NRC regulations. Furthermore, any NRC licensing decision will be based on all the information available at the time of a decision. Note: the complete text of the NRC's preliminary comments on the sufficiency of DOE's information for inclusion in a license application for a possible geologic repository at Yucca Mountain can be accessed through the NRC's home page at: http://www.nrc.gov.

b. Meetings

Quarterly DOE Quality Assurance and Management Meeting

On December 5-6, 2001, Division of Waste Management staff met with the DOE to discuss quality assurance (QA), issue resolution, and management concerns. This quarterly meeting was a three-way video conference hosted at the NRC Headquarters, with connections to the Yucca Mountain Site Characterization Office in Las Vegas, Nevada, and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas. DOE's QA presentations addressed the QA Management Assessment report findings; the purpose and strategy of the performance improvement transition plan; and the status of data and software qualification and model validation. Both NRC and DOE presented information on the status of, and the process for, issue resolution. During the management meeting, DOE provided a program update, a discussion of the Office of Civilian Radioactive Waste Management Concerns Program, and

addressed NRC/DOE communication issues. DOE agreed to address new action items by providing additional information requested by the NRC.

As discussed during these meetings, DOE's Office of Civilian Radioactive Waste Management (OCRWM) is nearing completion of their Performance Improvement Transition Plan. This Plan addresses issues of quality assurance, safety, project management, and human performance. The objective of the Plan is to ensure an expected level of performance for a potential license application. Although project schedules originally targeted release of the Plan in mid-December, the NRC was notified on December 14, 2001, that in order to ensure that this document represented a comprehensive response to repetitive findings related to quality assurance and technical document deficiencies, additional time was necessary to complete the Plan. Accordingly, DOE established a revised completion schedule for the Plan of mid-January 2002.

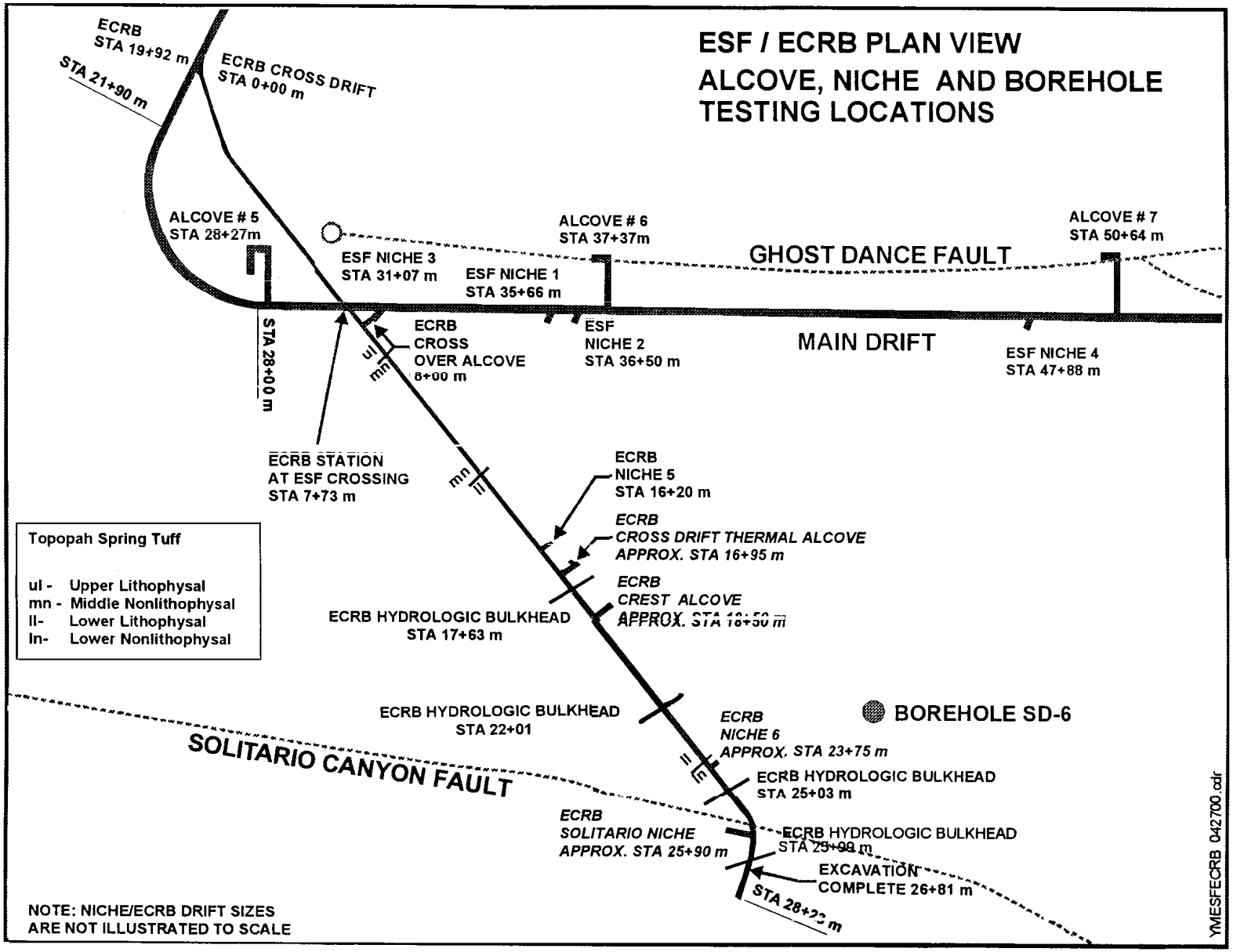
Department of Energy Public Hearing on Yucca Mountain
On December 12, 2001, the OR's attended the DOE's final supplemental hearing related to the potential site recommendation of the Yucca Mountain project. DOE Secretary Spencer Abraham and Undersecretary Robert Card attended this hearing in Las Vegas, Nevada. The DOE representatives received comments from 43 of the roughly 70 attendees. Secretary Abraham held a news briefing and responded to media questions during the latter portion of the hearing. The purpose of the added hearings, conducted at various locations in Nevada from November 14 through December 12, 2001, was to provide the public with more opportunities to file their comments on Yucca Mountain site characterization.

Department of Energy Publishes Siting Guidelines for Yucca Mountain
On November 14, 2001, final guidelines the DOE will use to determine the suitability of the Yucca Mountain site for development as a possible geologic repository for the disposal of spent nuclear fuel and other high-level radioactive waste were published in the Federal Register (66 FR 57298). These guidelines have been designated 10 CFR Part 963 and were concurred on by the Commission on September 24, 2001. Pursuant to the Nuclear Waste Policy Amendments Act of 1988, DOE was to characterize only the Yucca Mountain site. Based on these activities and applying the criteria found in Part 963, the Secretary of Energy will make a recommendation to the President on the suitability of Yucca Mountain for a Nuclear Regulatory Commission construction authorization application as a possible repository.

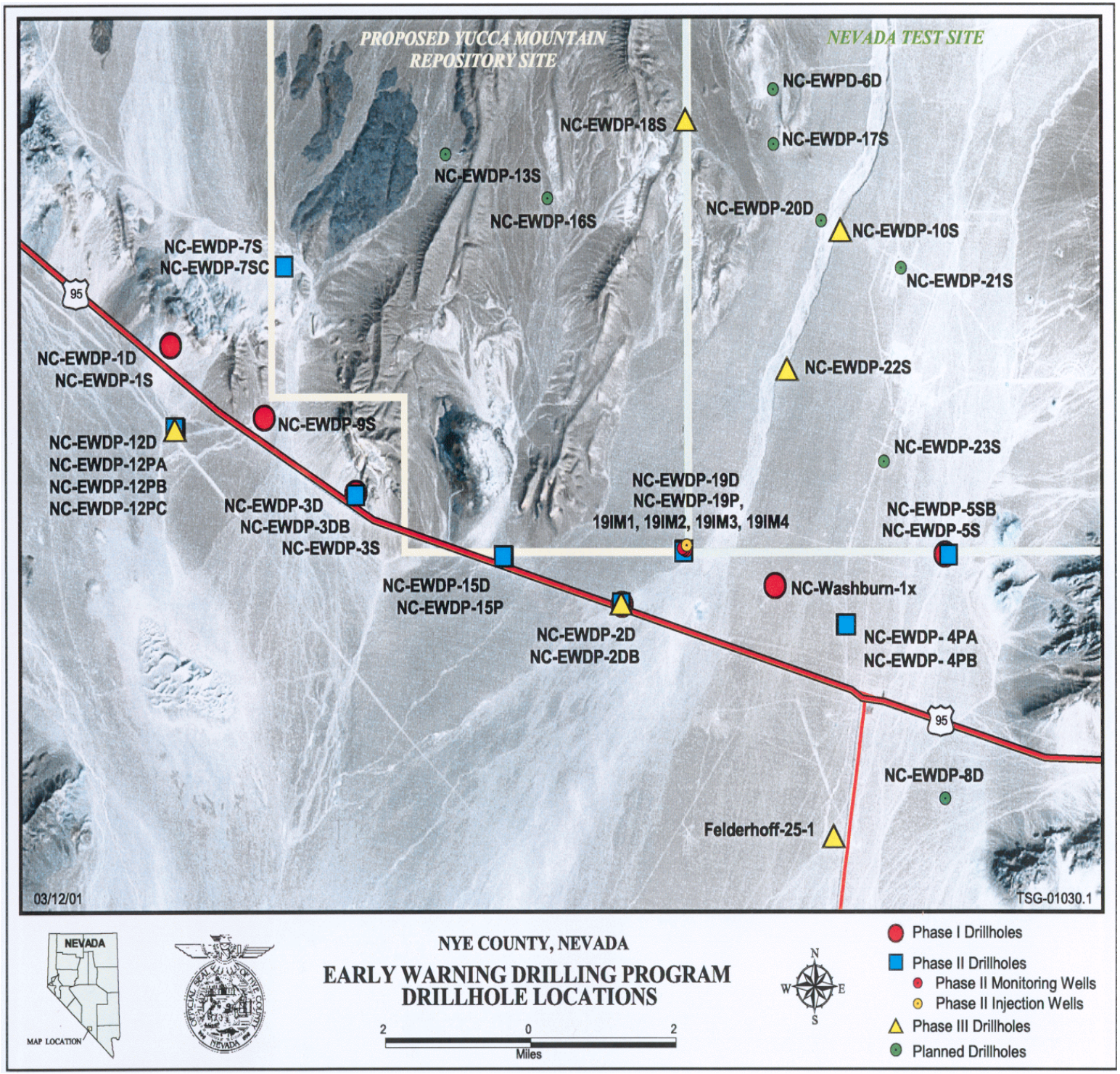
c. Site Visits
On December 19, 2001, the OR's accompanied a representative from the NRC's Office of Nuclear Materials Safety and Safeguards on a site visit to the Yucca Mountain facility. The purpose of this visit was to obtain an overview of DOE's site characterization activities.

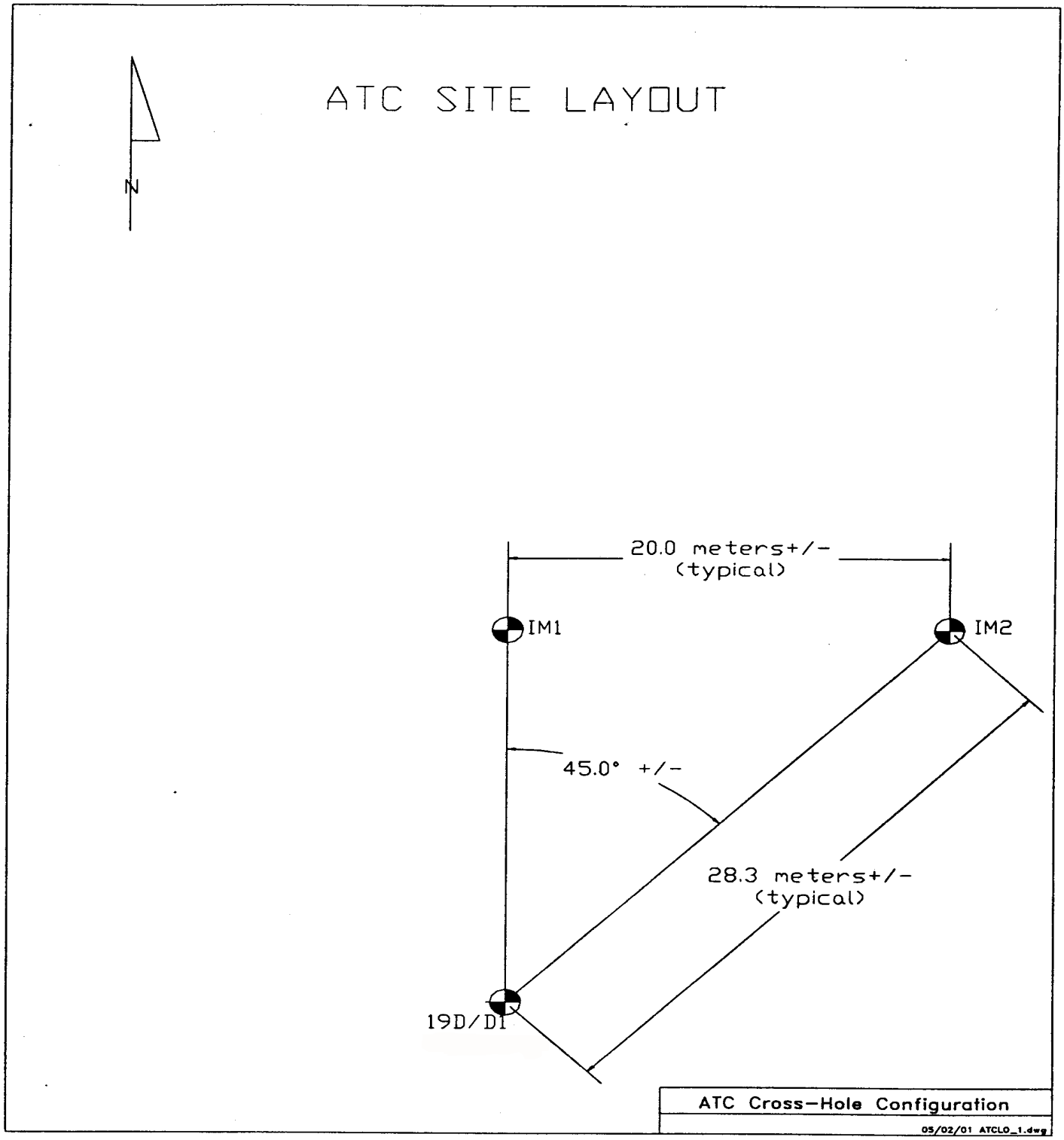
There were no outstanding issues raised as a result of these visits.

Enclosure 2


ESF / ECRB PLAN VIEW
ALCOVE, NICHE AND BOREHOLE TESTING LOCATIONS
ECRB STA 19+92 m
STA 21+90 m
ECRB CROSS DRIFT STA 0+00 m
ALCOVE # 5 STA 28+27m
ALCOVE # 6 STA 37+37m
ALCOVE # 7 STA 50+64 m
GHOST DANCE FAULT
ESF NICHE 3 STA 31+07 m
ESF NICHE 1 STA 35+66 m
ECRB CROSS OVER ALCOVE 8+00 m
ESF NICHE 2 STA 36+50 m
MAIN DRIFT
ESF NICHE 4 STA 47+88 m
STA 28+00 m
ECRB STATION AT ESF CROSSING STA 7+73 m
ECRB NICHE 5 STA 16+20 m
ECRB CROSS DRIFT THERMAL ALCOVE APPROX. STA 16+95 m
ECRB CREST ALCOVE APPROX. STA 18+50 m
ECRB HYDROLOGIC BULKHEAD STA 17+63 m
Topopah Spring Tuff
ui - Upper Lithophysal
mn - Middle Nonlithophysal
ll- Lower Lithophysal
ln- Lower Nonlithophysal
ECRB HYDROLOGIC BULKHEAD STA 22+01
BOREHOLE SD-6
ECRB NICHE 6 APPROX. STA 23+75 m
SOLITARIO CANYON FAULT
ECRB HYDROLOGIC BULKHEAD STA 25+03 m
ECRB SOLITARIO NICHE APPROX. STA 25+90 m
ECRB HYDROLOGIC BULKHEAD STA 25+99 m
EXCAVATION COMPLETE 26+81 m
STA 28+22 m
NOTE: NICHE/ECRB DRIFT SIZES ARE NOT ILLUSTRATED TO SCALE
YMESFECRB 042700.cdr

Enclosure 3


PROPOSED YUCCA MOUNTAIN REPOSITORY SITE
NEVADA TEST SITE
NC-EWPD-6D
NC-EWDP-18S
NC-EWDP-17S
NC-EWDP-13S
NC-EWDP-16S
NC-EWDP-20D
NC-EWDP-10S
NC-EWDP-7S
NC-EWDP-7SC
NC-EWDP-21S
95
NC-EWDP-1D
NC-EWDP-1S
NC-EWDP-22S
NC-EWDP-9S
NC-EWDP-12D
NC-EWDP-12PA
NC-EWDP-12PB
NC-EWDP-12PC
NC-EWDP-23S
NC-EWDP-19D
NC-EWDP-19P,
19IM1, 19IM2, 19IM3, 19IM4
NC-EWDP-3D
NC-EWDP-3DB
NC-EWDP-3S
NC-EWDP-5SB
NC-EWDP-5S
NC-EWDP-15D
NC-EWDP-15P
NC-Washburn-1x
NC-EWDP-2D
NC-EWDP-2DB
NC-EWDP- 4PA
NC-EWDP- 4PB
95
NC-EWDP-8D
Felderhoff-25-1
03/12/01
TSG-01030.1
NEVADA
MAP LOCATION
NYE COUNTY, NEVADA
EARLY WARNING DRILLING PROGRAM
DRILLHOLE LOCATIONS
2 0 2
Miles
N
W
E
S
Phase I Drillholes
Phase II Drillholes
Phase II Monitoring Wells
Phase II Injection Wells
Phase III Drillholes
Planned Drillholes


ATC SITE LAYOUT
N
20.0 meters+/-
(typical)
IM1
IM2
45.0° +/-
28.3 meters+/-
(typical)
19D/D1
ATC Cross-Hole Configuration
05/02/01 ATCLO_1.dwg

Enclosure 4